

Whiskeytown Fire Management Plan

Draft Environmental Impact Statement

February 2003
Department of the Interior
National Park Service
Pacific West Region
Whiskeytown National Recreation Area

Abstract This document presents three action alternatives and a no action alternative for a revised Fire Management Plan at Whiskeytown National Recreation Area. Revisions to the current fire management plan are needed to meet public and firefighter safety, natural and cultural resource management, and wildland urban interface objectives of the park. The action alternatives vary in the emphasis they place on the eight fire management goals developed by the park. The current program has been effective in fire suppression, but is not able to restore large portions of the park to landscapes approximating the mid 1800s as required by the park's General Management Plan. Each action alternative contains an amendment to the park's General Management Plan to clarify that the park headquarters may be rebuilt in its current location as a part of the fire cache relocation to the Oak Bottom Campground.

Whiskeytown National Recreation Area straddles California Highway 299 eight miles west of Redding California and encompasses 42,500 acres—including the 3,000 acre Whiskeytown Lake. This reservoir was created by damming Clear Creek and importing water from the Trinity River for hydroelectric power production and irrigation needs. Wildland fire has occurred naturally throughout the park as an important ecosystem process that kept forest fuels and vegetation community structures within their natural range of variability. Mining, logging, and past fire suppression activities have led to increases in fuel loads and changes in vegetation community structure, and to the increasing potential for large high-intensity wildland fire within the park, affecting developed zones, the park's natural and cultural resources, and neighboring land owners and communities. The risk of severe fire behavior is most prevalent in areas where vegetation has been modified by past land uses and where fire has been excluded. The treatments proposed in this Draft Environmental Impact Statement would be guided by restoration of historic landscapes and processes and reducing fuels in the wildland urban interface zone.

Comments This Draft Environmental Impact Statement is open to public review and comment for 60 days following the posting of the Notice of Availability in the Federal Register. When this filing is made, the closing date for the comment period will be posted on the park website. Comments should be directed to:

Superintendent, Whiskeytown National Recreation Area
ATTN: Fire Management Plan
P.O. Box 188
Whiskeytown, CA 96095-0188



United States Department of the Interior



Dear Friends,

The *Draft Environmental Impact Statement* for the *Whiskeytown Fire Management Plan* has been prepared to update the park's fire management program. Additionally, the National Park Service has been directed by Congress to address, in an up to date manner, the way hazardous fuels accumulate in relation to the safety of fire fighters, the public, and our neighbors in surrounding communities. The mission of the National Park Service is

"...to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations..."

Whiskeytown's recently published General Management Plan identified a goal of returning the undeveloped landscapes of the park to circa 1850s condition. Wildland fire suppression, mining and logging have all contributed to safety and ecological hazards that must be addressed.

This Draft Environmental Impact Statement presents four alternatives (including a no action alternative) that propose to deal with the complex problems of fire hazard reduction in the wildland urban interface and restoring some forest conditions to reflect the circa 1850s landscape. We can do this while meeting the mission of the National Park Service. The overriding concerns of each of these alternatives are the safety of fire fighters, the protection of property, natural resources and historic properties.

Your involvement is a key component in the planning process, and I invite you to participate. Meetings and tours are being arranged within Whiskeytown to discuss and demonstrate some of the issues and concerns mentioned in this document. Information on closing dates for the comment period and dates for meetings and tours will be sent to you in a separate postcard and will also be posted on our park website at <http://www.nps.gov/whis/exp/fireweb/firehomepage.htm>. Please submit comments that you may have to me at:

Superintendent, Whiskeytown National Recreation Area
ATTN: Fire Management Plan
P.O. Box 188
Whiskeytown, CA 96095- 0188
Fax: 530- 246- 5154
Email: whis_planning@nps.gov

I look forward to receiving your comments on this draft document. A Final Environmental Impact Statement will be prepared after the 60 day comment period has ended and after all comments are reviewed. There will be a 30 day review period once the Final Environmental Impact Statement is issued. Following the review period, a Record of Decision incorporating Whiskeytown's new Fire Management Plan will be issued.

Sincerely,

Jim F. Milestone
Superintendent

Executive Summary

Draft Environmental Impact Statement Fire Management Plan Whiskeytown National Recreation Area

Introduction

National Park Service policy requires that each park with vegetation capable of burning prepare a plan to guide a fire management program responsive to natural and cultural resource objectives, protection of developed facilities, and safety considerations for park visitors and staff.

Whiskeytown National Recreation Area is currently operating under a Fire Management Plan that was written in 1985 and revised in 1993. The existing plan addresses various fire management techniques, including fire suppression, prescribed fire, and the limited use of mechanical treatment to reduce forest fuels. The National Park Service proposes to revise Whiskeytown's Fire Management Plan to expand the use of prescribed fire and mechanical treatment and to introduce the use of selected lightning- ignited fires to meet fire management goals at Whiskeytown

Purpose and need for the Fire Management Plan

Wildland fire management activities in National Park sites are essential to the protection of human life, personal property and irreplaceable natural and cultural resources. Safety is critical when considering the park's seven in- holders, numerous National Park structures, and the fact that the majority of the park's visitation takes place in these plant communities and associated fire regimes. It is because of this, and the proximity to communities like French Gulch, Old Shasta, Centerville, Igo, and Redding, that the National Park Service has identified Whiskeytown National Recreation Area as being at high risk for high severity wildland fire.

Need for a plan

The means by which we need to provide for safety while restoring and sustaining these ecosystems are sometimes controversial. Letting nature take its course may be appropriate in some areas that have been relatively unaffected by human activities, and disturbance regimes have remained relatively intact. Yet, this approach cannot be carried over to where life and property are threatened, as well as where forests have been logged and deprived of fire for what is estimated to be over seventy years. Given these conditions, continued fire suppression will be required, but suppression alone will only exacerbate the growing problems, particularly in areas of overly dense stands and excessive fuels.

This draft Environmental Impact Statement analyzes four alternative approaches to managing fire in the park. The alternative that is selected would be adopted as the new Fire Management Plan to guide the fire management program. Authority to develop a fire management program is derived from the National Park Service Organic Act (16 U.S.C. 1 et seq.), and in delegations of authority found in Part 245 of the Department of the Interior Manual. Director's Order 18 also provides guidance to National Park Service wildland fire management and Director's Order 12 guides National Park Service implementation of the National Environmental Policy Act (NEPA).

The Fire Management Plan for Whiskeytown National Recreation Area is being developed in coordination with other park planning documents, including the General Management Plan, completed in 2001. The General Management Plan states that the purpose of the fire management program would be expanded to improve wildlife habitat, stimulate biodiversity, maintain healthy watersheds, reduce exotic species, and restore circa 1800 landscape conditions.

Decisions to be made

This draft Environmental Impact Statement analyzes four alternative approaches to fire management at Whiskeytown National Recreation Area. The park superintendent would use the information provided in this document, along with input received during the 60 day public comment period, to recommend to the Regional Director of the National Park Service which alternative should be selected. The selected alternative would update the Fire Management Plan and guide fire management in the park over the next ten years.

Planning issues considered

Issues are the concerns raised by park staff, other government agencies, and the public that were used to develop and evaluate the alternatives in this document. Concerns ranged from the impacts of wildland fire to the impacts associated with management actions taken to manage fire and reduce fuels. Planning issues discussed in this draft document include impacts to the biological environment (vegetation, wildlife), the physical environment (soils, geologic resources, water quality, wetlands/floodplains, and air quality), the cultural environment (cultural resources, sacred sites), and the social environment (health and safety, community economics, recreation, and visual resources).

Alternatives

Formulation of alternatives

An interdisciplinary team of National Park Service staff developed the alternatives described in this document with input from the public and other agencies. The interdisciplinary team was comprised of staff with expertise in fire management, wildlife, biology, botany, ecology, geology, safety, recreation, cultural resources, and public land policy and regulations. Public and interagency input was solicited and received through a scoping process. Four different approaches to managing fire at Whiskeytown were identified through this process and analyzed.

Alternative I: No Action (Current Program)

The National Environmental Policy Act requires that environmental analysis documents include a No- Action alternative. The No- Action alternative for plan modifications, such as the proposed update of Whiskeytown's Fire Management Plan, assumes that no new actions would be taken. The current fire management program utilizes a limited range of fire management strategies - including prescribed fire, Level 1 mechanical treatment, and suppression of all wildland fires (including natural ignitions). Implementation of these strategies specific to this alternative is described below.

Prescribed fire

The current program includes both broadcast and pile burning components, with prescribed fire projects range in size from 0.5 to 1000 acres occurring in all vegetation types. Projects located within prescribed fire burn units occur during the non- dormant season from 0- 5% of the time. Projects located in shaded fuel breaks occur during the non- dormant season 20- 30% of the time. Maximum burning in a given year under this alternative would be 1400 acres.

Mechanical treatment

Level 1 mechanical treatment would be utilized to reduce hazardous fuel levels in the park. This would include the use of chain saws, weed-eaters, hand crews, and chippers to clear around buildings, to install and maintain shaded fuel breaks, and to clear along roadways. The existing WUI program would continue under this alternative. Total maintained shaded fuel break acres would be 850 acres, with as needed maintenance based on site evaluations occurring at least every three years. Annual average maintenance of all mechanically treated areas under this alternative would be 275 acres.

Among the beneficial impacts of this alternative are the ability to pre-plan for prescribed burns, mechanical treatments and shaded fuel break construction and maintenance. On the other hand, at the proposed treatment level, reduction of hazardous fuels would take several decades, increasing the possibility that high severity wildland fires could occur and result in major and permanent adverse impacts to cultural resources.

Alternative I is compatible with adjacent fire agency planning effort—the shaded fuel break system currently being implemented by Whiskeytown is a component of these plans. Any actions taken on surrounding lands would result in effects similar to fire management activities in the national park, with the same types of risks. The moderate effects of the treatments in the Whiskeytown wildland urban interface under Alternative I would potentially become beneficial, short-term and moderate.

Alternative II: Prescribed Fire Dominated

Under Alternative II, the fire program would focus on the intentional use of fire through the application of prescribed fire to meet ecological restoration and maintenance objectives, and to reduce hazardous fuels throughout the park. All other fires would be suppressed including natural ignitions. Mechanical treatment would only be used to construct prescribed burn unit boundaries and to reduce fuels around developed areas. Implementation of these strategies specific to this alternative is described below.

Prescribed fire

This alternative would include pile burning and broadcast burning. Projects under Alternative II would include areas up to 1,000 acres in size to simulate, to the greatest extent feasible, the scale and pattern of natural fire events. Up to 3,000 acres would be burned during each year of implementation. Due to the limited available prescription windows during the dormant season, alternative II would implement prescribed burns during the non-dormant season from 10%-20% of the time to maximize all available prescription windows for execution of prescribed fire projects.

Mechanical treatment

Level 1 mechanical treatment would be used to accomplish hazard fuel and resource management objectives in developed areas or other improvements. It would also be used to prepare shaded fuel breaks for use as prescribed fire burn unit's boundaries. Total average mechanical treatment level 1 acres would be 80 annually.

This alternative meets several of the park's stated fire management objectives. Reliance on prescribed fire as the primary tool for landscape vegetation restoration would require a longer period of time than other alternatives with a broader range of fire management tools. Prescribed fires may escape to become wildland fires. However, this risk is offset by the reduced risk of large, unmanageable, and severe wildland fires.

Alternative II conflicts with adjacent land use plans because of the elimination of the shaded fuel break system. The West Redding shaded fuel break system, developed by the local cooperating agencies, includes the lands in Whiskeytown - they are strategic areas that are essential to the effectiveness of the program. The emphasis on reducing fire risk is compatible with adjacent land plans. The implications for suppression would be mixed—a beneficial reduction in fuels is countered by reduced access for firefighters due to lack of shaded fuel break system during holding actions. Reduced holding action capacity can mean increased risk in escaped prescribed fires.

In summary, Alternative II would address the fire management program goals outlined earlier, however relying on the limited tool of prescribed fire could be problematic for the fire management staff. By limiting the types of tools available for the fire program, this alternative indirectly increases involvement of outside agencies in accomplishing fire management treatment targets. This alternative may end up requiring a great deal of planning to occur with limited implementation ability.

Alternative III: Suppression Dominated

Under Alternative III, all natural and human- ignited wildland fires would be suppressed. Prescribed burning would only occur in conjunction with mechanical fuel treatments around developments and on shaded fuel breaks. Mechanical treatment level 1 and level 2 would be utilized with fuel reduction as the primary goal of projects implemented under this alternative. Implementation of these strategies specific to this alternative is described below.

Prescribed fire

Alternative III would consist of pile burning and a few prescribed fire projects to strengthen and widen by up to $\frac{1}{4}$ to $\frac{1}{2}$ mile shaded fuel breaks for tactical purposes in the case of suppression fire events. No large, broadcast burns would be conducted. Up to 250 acres would be burned during each year of implementation.

Mechanical treatment levels 1 and 2

This alternative would use both mechanical treatment levels 1 and 2. Mechanical treatment would be used to reduce forest fuels in and around developed areas, and to install new shaded fuel breaks, and widen existing shaded fuel breaks. Annual program levels would be up to 225 acres for each of the two mechanical treatment levels proposed in this alternative.

Alternative III is generally compatible with adjacent land use plans. Its emphasis on preparedness, suppression, and hazard fuel reduction is especially complimentary to the CDF state plan, and area plans. The expanded use of mechanical treatment is compatible with land use plans. Its lack of emphasis on forest health is slightly at odds with the BLM plan. A fuels buildup in the interior portions of the Recreation Area would make suppression difficult, raising fire risk. Wildland fires could grow rapidly.

In summary, Alternative III would address the fire management program goals outlined earlier; however the emphasis on mechanical treatment, with its associated equipment accessibility limitations in large sections of the park, would increase the risk of high frequency, high intensity wildland fires in areas most inaccessible to fire fighters.

Alternative IV: Multiple Strategy Program (Preferred Alternative)

This alternative would focus on restoring Whiskeytown's plant communities to reduce the risk of high severity wildland fire by decreasing forest stand density, reducing surface fuels, and attempting to restore fire as a natural disturbance process to the greatest extent feasible. Implementation of these strategies specific to this alternative is described below.

Prescribed fire

This alternative would include both pile and broadcast burns. Project size for Alternative IV would range from 0.5 to 1,000 acres, and would occur in all vegetation types. Up to 2,200 acres would be treated in each year of implementation, included in which are wildland fire use acres. Projects located within prescribed fire burn units would occur during the non-dormant season from 0- 15% of the time. Projects located in shaded fuel breaks would occur during the non-dormant season 20- 30% of the time.

Wildland Fire Use

Wildland Fire Use is being considered in Alternative IV as an additional fire management tool that Whiskeytown may use to reduce the unnatural accumulation of forest fuels and to restore fire to the ecosystem. Total acres would vary considerably from year to year, but would average no more than 150/year over a several year period. Total annual acres for wildland fire use are included in the 2,200 acre total listed for prescribed fire.

Mechanical treatment levels 1, 2 and 3

All three levels of mechanical treatment would be utilized to reduce fuel levels and mimic the effects of fire on structural patterns of woody vegetation. Mechanical treatment would be used to reduce forest fuels in and around developed areas, and to install and widen new and existing shaded fuel breaks, respectively. Totals of mechanical treatment would be up to 1075 acres/year.

Alternative IV is generally compatible with adjacent land use plans. The increased focus on the shaded fuel break system, and mechanical treatments for fuels is emphasized on neighboring lands. The additional emphasis on mechanical treatments, including the use of mechanized equipment to reduce brush and thin trees, is compatible with adjacent land use plans, which currently call for mechanized equipment to reduce hazard fuels and restore landscapes.

A potential conflict is the added strategy of wildland fire use. This strategy is not utilized by the California Department of Forestry and Fire Protection (CDF) on their direct protection lands, and would be a new strategy for the area. The potential conflicts can be mitigated by careful application of this strategy, close cooperation between CDF and National Park Service, and a clear understanding of the parameters of the use of this strategy.

In summary, Alternative IV would address the fire management program goals outlined earlier, using the broadest set of fire management tools available to potentially accomplish more than any of the other alternatives offered in this document.

Actions common to all alternatives

The actions described in the subsections below are a component of each of the four alternatives considered in this document.

Fire Management and Coordination

All fire management activities at Whiskeytown are coordinated and implemented by a professional fire management staff in coordination with natural and cultural resource specialists. Other agencies are involved in the planning and execution of fire management actions in the park. These include the United States Forest Service, the Bureau of Land Management, the California Department of Forestry and Fire Protection, and the Western Shasta Resource Conservation District. Work crews from the California Conservation Corps are utilized, as are additional crews that are hired on contract.

Suppression

Suppression is the activity most people associate with fire management and includes all actions taken to put out an active fire, and is defined as the restriction of the spread of a wildland fire and the elimination of all threats from that fire. Alternatives that include fire risk reduction treatments and shaded fuel breaks will provide for a greater range of suppression options.

Prescribed fire

Prescribed Fire is the use of management- ignited fire to meet specific resource goals and objectives under pre- defined fuel and weather conditions. It is a component of each of the alternatives analyzed in this document, although significant differences do exist among the alternatives. The specific use of prescribed fire, ranging from small pile burning projects to larger broadcast burns, is described in greater detail for each alternative.

Mechanical treatment level 1

Mechanical treatment is a term used to describe the application of various tools and equipment by fire management staff to reduce fuels and achieve fire management goals. Three levels of mechanical treatment are being considered at Whiskeytown, but level 1 mechanical treatment is the only type of mechanical treatment common to all four alternatives.

Fire information and education

The National Park Service manages an active fire information/education program in the park. The park staff includes a Fire Information and Education Specialist in response to growing responsibilities as a result of the Wildland Urban Interface Initiative. This program assists in educating NPS employees, and volunteers, concession employees, cooperating association employees, other agencies, park visitors and the general public about fire management goals and policies.

Relocate fire cache to Oak Bottom and build new administration building at park headquarters

The park General Management Plan (2001) identified both the need for replacing the current decentralized fire cache and developing a modern park headquarters facility. The relocation of the Whiskeytown fire cache building from the park headquarters compound and construction of a new fire cache in the Oak Bottom recreational complex is a component of each action alternative. Also under each of the action alternatives, the park's current General Management Plan will be amended to clarify that the National Park Service would have the option of considering within its range of alternatives the construction a new administrative building at the park headquarters on Kennedy Memorial Drive.

Affected environment

A list of specific resource topics was developed to focus on and compare environmental impacts of fire management activities among alternatives. These resource topics were selected based on federal law, regulation, and executive orders; National Park Service management policies; National Park Service and federal wildland fire management policies; National Park Service subject matter expertise; and concerns expressed by the public or other agencies during the public scoping periods.

The existing environment that could be affected by actions proposed in this document is described in Chapter 3. These conditions establish the baseline for the analysis of effects found in Chapter 4, Impacts. None of the action alternatives considered in this document would impair these resources.

Environmental Impacts

An impact analysis for each impact topics in the affected environment has been completed for each of the four alternatives in the Draft Environmental Impact Statement for the Fire Management Plan, Whiskeytown National Recreation Area. Chapter 4, Impacts, describes both beneficial and adverse effects in detail. In developing the alternatives, the interdisciplinary team identified actions that would provide for a balance between the actions that generate adverse impacts and actions that generate beneficial impacts. Additionally, some actions will have immediate adverse, though short term impacts—and also will have a longer term, beneficial impact. The complexity of returning fire back into the ecosystem should not be lost in reviewing the information provided in Chapter 4, Impacts.

The table on the next page describes the range of impacts for each affected environment by alternative.

Impacts Summary

| Affected Environment | Alternative I No Action | Alternative II Prescribed Fire Dominated | Alternative III Suppression Dominated | Alternative IV Multiple Strategy Program |
|---|--|--|--|--|
| Biological Environment | | | | |
| Vegetation Communities | Adverse to beneficial, negligible to major, short to long term, more data needed | Adverse to beneficial, negligible to major, short to long term, more data needed | Adverse to beneficial, negligible to major, short to long term, more data needed | Adverse to beneficial, negligible to major, short to long term, more data needed |
| Wildlife and Fish | Moderate to major, adverse, long term, more data needed | Minor short term adverse to moderate long term beneficial, more data needed | Moderate to major, adverse, long term, more data needed | Minor short term adverse to moderate long term beneficial, more data needed |
| Special Status Species | Moderate to major, adverse, long term, more data needed | Minor short term adverse to moderate long term beneficial, more data needed | Moderate to major, adverse, long term, more data needed | Minor short term adverse to moderate long term beneficial, more data needed |
| Geophysical Environment | | | | |
| Soils | Beneficial, major, long term | Beneficial, major, long term | Beneficial, major, long term | Beneficial, major, long term |
| Water Quality | Beneficial, major, long term | Beneficial, major, long term | Beneficial, major, long term | Beneficial, major, long term |
| Air Quality | Adverse, negligible to major, short to long-term | Adverse, negligible to major, short to long-term | Adverse, negligible to major, short to long-term | Adverse, negligible to major, short to long-term |
| Ecologically Critical Area | More data is needed, moderate to major, adverse, long term | More data is needed, minor short term adverse to moderate long term beneficial | More data is needed, moderate to major, adverse, long term | More data is needed, minor short term adverse to moderate long term beneficial |
| Cultural Environment and Special Designations | | | | |
| Archaeological properties, historical structures, ethnographic resources, cultural landscapes, museum collections | Long term moderate beneficial to short term major adverse | Long term moderate beneficial to short term major adverse to beneficial | Long term major adverse | Long term moderate beneficial to short term major adverse |
| Social Environment | | | | |
| Health and Safety | Adverse, negligible to major, short to long term | Adverse, negligible to major, short to long term | Adverse, negligible to major, short to long term | Adverse, negligible to major, short to long term |
| Community Economics | Beneficial, minor to moderate, short to long-term | Beneficial, minor to moderate, short to long-term | Beneficial, minor to moderate, short to long-term | Beneficial, minor to moderate, short to long-term |
| Visual Resources | Beneficial, minor, long term | Beneficial, moderate, long term | Beneficial, moderate, long term | Beneficial, moderate, long term |
| Recreation | Adverse to beneficial, minor, long term | Adverse to beneficial, minor, long term | Adverse to beneficial, minor, long term | Adverse to beneficial, minor, long term |
| Compatibility with Land Use Plans | Negligible beneficial long term | Moderate ,adverse, short term to Moderate beneficial, long term | Adverse to beneficial, negligible, long term | Moderate ,adverse , short term to major, beneficial, long term |

Table of Contents

| | |
|--|----|
| Executive Summary | ii |
| Chapter 1: Introduction | 5 |
| Program goals | 9 |
| Authority for action and related plans..... | 9 |
| Decisions to be made..... | 10 |
| Planning issues considered..... | 10 |
| Impairment summary statement | 11 |
| Chapter 2: The Alternatives..... | 12 |
| Development of alternatives | 12 |
| Suppression..... | 13 |
| Prescribed fire | 15 |
| Mechanical treatment | 19 |
| Wildland Fire Use | 29 |
| Actions common to all alternatives | 32 |
| Suppression..... | 32 |
| Prescribed fire | 33 |
| Mechanical treatment level 1..... | 33 |
| Fire information and education | 33 |
| Relocate fire cache to Oak Bottom and build new administration building at park headquarters | 33 |
| Alternative I: No Action (Current Program)..... | 35 |
| Prescribed fire | 35 |
| Wildland fire use | 35 |
| Mechanical treatment | 35 |
| Purpose and need | 37 |
| Impact summary and impairment statement..... | 38 |
| Alternative II: Prescribed Fire Dominated..... | 39 |
| Prescribed fire | 39 |
| Wildland fire use | 39 |
| Mechanical treatment | 40 |
| Purpose and need | 41 |
| Impact summary and impairment statement..... | 42 |
| Alternative III: Suppression Dominated..... | 43 |
| Prescribed fire | 43 |
| Wildland fire use | 43 |
| Mechanical treatment levels 1 and 2 | 44 |
| Purpose and need | 46 |
| Impact summary and impairment statement..... | 47 |
| Alternative IV: Multiple Strategy Program (Preferred Alternative)..... | 48 |
| Prescribed fire | 48 |
| Wildland fire use | 48 |
| Mechanical treatment levels 1, 2 and 3 | 49 |
| Impact summary and impairment statement..... | 52 |
| The environmentally preferred alternative | 53 |
| Range of Alternatives | 54 |
| Alternatives eliminated from further study..... | 54 |
| Table 2-8 Range of alternatives compared by Shaded Fuel Break System utilization..... | 57 |
| Table 2-9 Range of alternatives compared by Shaded Fuel Break System utilization (continued) | 58 |
| Chapter 3: The Affected Environment | 60 |
| Background on Whiskeytown National Recreation Area..... | 60 |
| Climate | 60 |
| Fire history | 61 |

| | |
|---|-----|
| Impact Topics | 64 |
| Biological environment | 64 |
| Ecologically critical areas | 78 |
| Geophysical Environment | 79 |
| Cultural Environment and Special Designations | 88 |
| Social Environment | 95 |
| Impact topics considered but dismissed | 98 |
| Energy requirement and conservation potential | 98 |
| Unique agricultural lands | 98 |
| Environmental justice | 98 |
| Chapter 4: Environmental Consequences | 100 |
| Concept of impact analysis | 100 |
| Definition of terms | 101 |
| Type of impact | 101 |
| Context of impact | 101 |
| Duration of impact | 102 |
| Intensity of impact | 102 |
| Mitigation of impacts | 102 |
| Biological environment | 102 |
| Vegetation communities | 102 |
| Type of impact | 103 |
| Context of impact | 103 |
| Duration of impact | 103 |
| Intensity of impact | 103 |
| Wildlife | 183 |
| Soils and Water Quality | 208 |
| Wetlands and Floodplains | 215 |
| Air Quality | 215 |
| Areas of Special Consideration | 229 |
| Cultural Environment and Special Designations | 230 |
| Archaeological Resources | 230 |
| Social Environment | 249 |
| Compatibility with Land Use Plans | 249 |
| Health and Safety | 251 |
| Community Economics | 255 |
| Recreation | 268 |
| Visual Resources | 273 |
| Chapter 5: Consultation and Coordination | 280 |
| References | 291 |
| Index | 297 |
| List of Preparers | 299 |
| Appendix A: Whiskeytown NRA Species List | 301 |
| Appendix B: List of Classified Structures | 329 |
| Available at park upon request | 329 |

List of Figures and Tables

| | |
|---|----|
| Impacts Summary | ix |
| Map of Whiskeytown National Recreation Area Region | 8 |
| Current Shaded Fuel Break System at Whiskeytown National Recreation Area | 23 |
| Map of Mechanical Treatment Areas in Whiskeytown National Recreation Area | 27 |
| Current Shaded Fuel Break System | 36 |
| Map of Alternative I (No Action) | 37 |
| Map of Alternative II (Prescribed Fire Dominated) | 41 |
| Shaded Fuel Break System Under Alternative III (Suppression Dominated) | 45 |

| | |
|--|-----|
| <u>Map of Alternative III (Suppression Dominated)</u> | 46 |
| <u>Shaded Fuel Break System under Alternative IV (Multiple Strategy)</u> | 50 |
| <u>Map of Alternative IV (Multiple Strategy)</u> | 51 |
| <u>Range of alternatives compared by fire management goals</u> | 55 |
| <u>Scope of individual projects and annual program</u> | 56 |
| <u>Range of alternatives compared by fire management strategy</u> | 56 |
| <u>Impacts Summary</u> | 59 |
| <u>Map of Vegetation Community Association Zones by Elevation, Whiskeytown National Recreation Area</u> | 72 |
| <u>Sensitive Plants in Whiskeytown National Recreation Area</u> | 73 |
| <u>Map of Decomposed Granite Areas (hatched) and Slopes within Whiskeytown National Recreation Area</u> | 82 |
| <u>Status of ambient air quality designations for Shasta County</u> | 87 |
| <u>Prominent sensitive receptors in and around Whiskeytown National Recreation Area</u> | 88 |
| <u>Archaeological patterns in the Whiskeytown region</u> | 90 |
| <u>Affiliation of Historic Archaeological Sites</u> | 90 |
| <u>Contributing features of the Tower House Historic District</u> | 93 |
| <u>Vegetation cover types for Whiskeytown National Recreation Area</u> | 218 |
| <u>Composite Emission Factor Summary (Based on relative acreage)</u> | 219 |
| <u>Historical Average Annual Fire Emissions for Various Fire Types in Whiskeytown National Recreation Area</u> | 220 |
| <u>Emission Factors and Predicted Air Emissions Associated with Pile Burning for Various Alternatives</u> | 221 |
| <u>Predicted Air Emissions Associated with Various Fire Types in Whiskeytown National Recreation Area for Alternative I</u> | 222 |
| <u>Predicted Air Emissions Associated with Various Fire Types in Whiskeytown National Recreation Area for Alternative II</u> | 224 |
| <u>Air Emissions Associated with Various Fire Types in Whiskeytown National Recreation Area</u> | 226 |
| <u>Air Emissions Associated with Various Fire Types in Whiskeytown National Recreation Area</u> | 227 |
| <u>Characteristics of the Fuel Models at Whiskeytown</u> | 238 |
| <u>Relationship between survey coverage, vulnerability of cultural resources to fire impacts, topography, and vegetation</u> | 239 |
| <u>Alternative health and safety comparison</u> | 255 |
| <u>Program cost by alternative</u> | 266 |
| <u>Program summary of average acres/year to be treated by alternative</u> | 267 |
| <u>Summary of average annual program costs by alternative</u> | 267 |